The Euro Med treatment of Anthemideae (Compositae) — generic concepts and required new names

Authors: Greuter, Werner, &, Christoph Oberprieler, and Vogt, Robert

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WERNER GREUTER, CHRISTOPH OBERPRIELER & ROBERT VOGT

The Euro+Med treatment of *Anthemideae (Compositae)* – generic concepts and required new names

Abstract

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A synonymic survey of *Anthemideae* genera accepted for the purpose of the Euro+Med Project is presented. As a consequence of nomenclatural revision, shifts in generic circumscription or reassessment of accepted specific and subspecific taxa, combinations that are required in the genera *Achillea, Anthemis, Artemisia, Cota, Leucanthemum, Mecomischus, Phalacrocarpum, Rhodanthemum* and *Tanacetum,* but do not so far exist, are validated. A North African species hitherto lacking a valid name is described anew as *Plagius maghrebinus*.

Introduction

Euro+Med PlantBase is an international cooperative research project sponsored by the European Union and other bodies. It is coordinated by the School for Plant Sciences, University of Reading, U.K. In its present, initial phase of operation it is being funded through the EU's 5th Framework Programme for Research and has committed itself to deliver by the end of September 2003, among other things, an "Updated Synonymic Catalogue of the [Vascular] Plants of Europe". It is also preparing a working list of plant species and subspecies for the whole Euro+Med area, a vast portion of the globe comprising Europe (in the sense of Flora Europaea), the Mediterranean Area (as covered by Med-Checklist), Caucasia, Madeira and the Canary Islands. The main aims and structures of the Programme are displayed on the Internet (http://www.euromed.org.uk).

The final phase of editing the European Synonymic Catalogue and the Euro+Med working list takes place under conditions of strenuous work and unprecedented time stress. Synonymies established in the process, and nomenclatural checking, inevitably lead to a number of names being adopted that were not before validated. As the Catalogue is to be presented in print but will likely be produced in a limited number of copies, it is felt that it would be most undesirable that new combinations be validated in its body.

The editorial panel for the Checklist has therefore accepted the offer to publish at short notice the required new names and combinations in a series of "Notulae", in the journal Willdenowia.

This outlet is not necessarily intended as a one-off opportunity but may, if needed, be extended into the future, when work on the Catalogue and working list proceeds after the initial phase of implementation.

It is already certain that not all portions of the Catalogue and list will be ready by the deadline for submission of texts to the current issue of Willdenowia. In all likelihood, in the weeks to come further cases of names that are needed but were not so far validly published will turn up. Hopefully a way will be devised by which their validation in the printed list can be avoided, and postponed for inclusion in the next subsequent issue of Willdenowia.

The senior author of this note took charge of editing the *Compositae* family as a whole. In so doing, he sought the advice of competent specialists of the various tribes, principally but not exclusively on questions of generic delimitation. For the *Anthemideae* he obtained it from the two junior authors.

Euro+Med *Anthemideae* – a generic survey

The Euro+Med genera of *Anthemideae* accepted by us, with their relevant synonyms, are listed in Table 1. No complete synonymy is given, but those generic names that were adopted in recent floristic literature for the area have been taken into account.

Table 1. The Euro+Med genera of *Anthemideae*. Accepted names appear in bold-face type, their synonyms in italics. Bracketed names are of xenophytic (non-native) genera, quotation marks denote names applied in a sense that excludes their presently accepted type.

Aaronsohnia
Achillea
= *Ptarmica*
Anacyclus
Anthemis
= *Ammanthus*
= *Lyonnetia*
Arctanthemum
= *Hulteniella*
Argyranthemum
Artemisia
= *"Orsinia"*
= *Seriphidium*
Brocchia
Castrilanthemum
Chamaemelum
= *Perideraea*
Chlamydophora
[*Chrysanthemum*]
= *Dendranthema*
Chrysanthoglossum
Cladanthus
= *Ormenis*
Coleostephus
= *Kremeria*
= *Myconia*
Cota
Cotula
Daveaua
Endopappus
[*Eriocephalus*]
Glebionis
= *"Chrysanthemum"*
Glossopappus
Gonospermum
= *Lugoa*
Heliocauta
Heteranthemis
= *Pinardia*
Heteromera
Hymenostemma
Ismelia
Lasiospermum
Lepidophorum
Leucanthemella
Leucanthemopsis
Leucanthemum
Leucocyclus
Lonas
Matricaria
= *Chamomilla*
= *Lepidotheca*
Mauranthemum
= *Leucoglossum*
Mecomischus
= *Fradinia*
Nananthea
Nivellea
Otanthus
= *Diotis*
Otospermum
= *Otocarpum*
Pentzia
Phalacrocarpum
Plagius
Prolongoa
Rhetinolepis
Rhodanthemum
Santolina
[*Soliva*]
= *Gymnostyles*
Tanacetum
= [*Balsamita*]
= *Pyrethrum*
Tripleurospermum
= *Dibothrospermum*
= *"Matricaria"*

Since 1976 when vol. 5 of Flora Europaea was published, *Anthemideae* systematics have progressed considerably. As a result of new in-depth studies of phenotype features and, more recently, DNA sequences, combined with reasonably strict adherence to the tenets of phylogenetic systematics, several of the previously accepted genera have been remodelled, fused or split.

Fortunately a modern world survey of *Anthemideae* genera and their species exists, by Bremer & Humphries (in Bull. Nat. Hist. Mus., Bot. 23: 71-177. 1993), which takes into account the relevant facts and hypotheses known to date. This we have largely followed with respect to generic circumscription (e.g. by including *Hulteniella* in *Arctanthemum*) and nomenclature (e.g. by accepting *Tripleurospermum* while considering *Chamomilla* synonymous with *Matricaria;* see also Applequist in Taxon 51: 757-761. 2003), with the following exceptions.

We take a wider view than Bremer & Humphries of *Artemisia,* in which we include *Seriphidium* (see Vallès & al. in Pl. Biol. 5: 274-284. 2003), and of *Gonospermum,* to include *Lugoa* (Francisco-Ortega & al. in Amer. J. Bot. 88: 161-169. 2001).

Conversely, following a narrower concept of genera based on recent results from DNA sequence analysis, we separate *Cota* from *Anthemis* (see Oberprieler in Taxon 50: 745-762. 2001) and *Brocchia* from *Cotula* (Oberprieler, unpublished data). We also recognise the recently described *Castrilanthemum* (Vogt & Oberprieler in Anales Jard. Bot. Madrid 54: 342 1996), based on a previously unassessed, poorly known species.

Ormenis, placed in *Chamaemelum* by Bremer & Humphries, was recently shown to be better at home in *Cladanthus* instead (Oberprieler in Bot. J. Linn. Soc. 138: 255-273. 2002; Oberprieler & Vogt in Willdenowia 32: 197. 2002).

Finally, since 1993, two nomenclatural changes took place at the generic level. Consequent to the adoption of a proposal (Trehane in Taxon 44: 439-441. 1995) to conserve the name *Chrysanthemum* with *C. indicum* as its conserved type, i.e., in the sense of the ornamental chrysanthemums of the trade, *Dendranthema* reverted to the name *Chrysanthemum* while the former genuine *Chrysanthemum* of Mediterranean countries takes the name *Glebionis*. Furthermore, *Leucoglossum* Wilcox & al., being an illegitimate later homonym of the ascomycete *Leucoglossum* S. Imai, was replaced by *Mauranthemum* (Vogt & Oberprieler in Taxon 44: 377-378. 1995).

Achillea

Achillea pindicola subsp. ***corabensis*** (Heimerl) Greuter, **comb. nova** ≡ *Achillea clavennae* f. *corabensis* Heimerl in Österr. Bot. Z. 75: 140. 1926 ≡ *Achillea corabensis* (Heimerl) Micevski in Prilozi Oddel. Biol. Med. Nauki Maked. Akad. Nauk 5(2): 6. 1984.

Achillea rupestris subsp. ***calcarea*** (Huter & al.) Greuter, **comb. nova** ≡ *Achillea moschata* var. *calcarea* Huter & al. in sched. Iter Ital. 3: No. 379. 1877 ≡ *Achillea erba-rotta* subsp. *calcarea* (Huter & al.) I. Richardson in Bot. J. Linn. Soc. 71: 272. 1976.

Achillea rupestris subsp. ***lucana*** (Pignatti) Greuter, **comb. nova** ≡ *Achillea lucana* Pignatti in Giorn. Bot. Ital. 113: 366. 1980.

Achillea santolinoides subsp. ***wilhelmsii*** (K. Koch) Greuter, **comb. nova** ≡ *Achillea wilhelmsii* K. Koch in Linnaea 24: 328. 1851. – This combination is needed consequent to the rejection of a proposal (Valant-Vetschera in Taxon 47: 755-756. 1998) to conserve *Achillea wilhelmsii* against *A. santolinoides*.

Anthemis

Anthemis cretica subsp. ***cinerea*** (Pančić) Oberprieler & Greuter, **comb. nova** ≡ *Anthemis cinerea* Pančić, Elem. Fl. Bulg.: 39. 1883.

Anthemis cretica subsp. ***panachaica*** (Halácsy) Oberprieler & Greuter, **comb. nova** ≡ *Anthemis panachaica* Halácsy, Consp. Fl. Graec. 2: 57. 1902 ≡ *Anthemis abrotanifolia* subsp. *panachaica* (Halácsy) Govaerts, World Checklist Seed Pl. 1(1): 7. 1995.

Anthemis cretica subsp. ***petraea*** (Ten.) Oberprieler & Greuter, **comb. nova** ≡ *Anthemis petraea* Ten., Fl. Napol. 2: 246. 1820 ≡ *Anthemis montana* subsp. *petraea* (Ten.) Briq. & Cavill. in Burnat, Fl. Alpes Marit. 6: 156. 1916 ≡ *Anthemis carpatica* subsp. *petraea* (Ten.) R. Fern. in Bot. J. Linn. Soc. 70: 7. 1975.

Anthemis macedonica subsp. ***orbelica*** (Pančić) Oberprieler & Greuter, **comb. nova** ≡ *Anthemis orbelica* Pančić, Nova Elem. Fl. Bulg.: 27. 1886.

Anthemis macedonica subsp. ***stribrnyi*** (Velen.) Oberprieler & Greuter, **comb. nova** ≡ *Anthemis stribrnyi* Velen. in Sitzungsber. Königl. Böhm. Ges. Wiss. Prag, Math.-Naturwiss. Cl. 1895(37): 6. 1895.

Anthemis macedonica subsp. ***thracica*** (Griseb.) Oberprieler & Greuter, **comb. nova** ≡ *Anthemis montana* var. *thracica* Griseb., Spic. Fl. Rumel. 2: 209. 1846 ≡ *Anthemis orientalis* subsp. *thracica* (Griseb.) Stoj. & Acht. in Notizbl. Bot. Gart. Berlin-Dahlem 13: 515. 1937 ≡ *Anthemis thracica* (Griseb.) Stoj. & Acht. in Stojanov & Stefanov, Fl. Bulg., ed. 3: 1150. 1948.

Anthemis peregrina subsp. ***heracleotica*** (Boiss. & Heldr.) Oberprieler & Greuter, **comb. nova** ≡ *Anthemis peregrina* var. *heracleotica* Boiss. & Heldr. in Boissier, Diagn. Pl. Orient., ser. 2, 3: 21. 1856 ≡ *Anthemis tomentosa* subsp. *heracleotica* (Boiss. & Heldr.) R. Fern. in Bot. J. Linn. Soc. 70: 12. 1975. – At subspecies rank, the latter combination takes priority over the synonymous *Anthemis peregrina* subsp. *guicciardii* (Heldr. & Sart.) O. Georgiou, Biosust. Melet. Anthemis tomentosa: 104. 1990.

Artemisia

Artemisia alba subsp. ***kabylica*** (Chabert) Greuter, **comb. nova** ≡ *Artemisia kabylica* Chabert in Bull. Soc. Bot. France 36: 27. 1889. – The new combination was previously used by Quézel & Santa, Nouv. Fl. Algérie: 990. 1963, being ascribed to M[aire], but has not apparently been validated so far.

Artemisia campestris subsp. ***variabilis*** (Ten.) Greuter, **comb. nova** ≡ *Artemisia variabilis* Ten., Fl. Neapol. Prodr. App. 5: 28. 1826.

Cota

Cota dalmatica (Scheele) Oberprieler & Greuter, **comb. nova** ≡ *Anthemis dalmatica* Scheele in Linnaea 18: 464. 1845.

Cota dipsacea (Bornm.) Oberprieler & Greuter, **comb. nova** ≡ *Anthemis dipsacea* Bornm. in Mitth. Thüring. Bot. Vereins 23: 23. 1908.

Cota halophila (Boiss. & Balansa) Oberprieler & Greuter, **comb. nova** ≡ *Anthemis halophila* Boiss. & Balansa in Boissier, Fl. Orient. 3: 285. 1875.

Cota melanoloma subsp. ***trapezuntica*** (Grierson) Oberprieler & Greuter, **comb. nova** ≡ *Anthemis melanoloma* subsp. *trapezuntica* Grierson in Notes Roy. Bot. Gard. Edinburgh 33: 411. 1975.

Cota monantha (Willd.) Oberprieler & Greuter, **comb. nova** ≡ *Anthemis monantha* Willd., Sp. Pl. 3: 2187. 1803.

Cota oretana (Carretero) Oberprieler & Greuter, **comb. nova** ≡ *Anthemis oretana* Carretero in Bot. J. Linn. Soc. 110: 379. 1992.

Cota samuelssonii (Rech. f.) Oberprieler & Greuter, **comb. nova** ≡ *Anthemis samuelssonii* Rech.f. in Ark. Bot., ser. 2, 1: 325. 1950.

Cota tinctoria subsp. ***australis*** (R. Fern.) Oberprieler & Greuter, **comb. nova** ≡ *Anthemis tinctoria* subsp. *australis* R. Fern. in Bot. J. Linn. Soc. 70: 14. 1975.

Cota tinctoria subsp. ***euxina*** (Boiss.) Oberprieler & Greuter, **comb. nova** ≡ *Anthemis euxina* Boiss., Fl. Orient. 3: 282. 1875 = *Cota euxina* (Boiss.) Holub in Folia Geobot. Phytotax. 9: 270. 1974.

Cota tinctoria subsp. ***fussii*** (Griseb. & Schenk) Oberprieler & Greuter, **comb. nova** ≡ *Anthemis tinctoria* var. *fussii* Griseb. & Schenk in Arch. Naturgesch. 18: 338. 1852 ≡ *Anthemis tinctoria* subsp. *fussii* (Griseb. & Schenk) Beldie, Fl. Veg. Munț. Bucegi: 270. 1967.

Cota tinctoria subsp. ***gaudium-solis*** (Velen.) Oberprieler & Greuter, **comb. nova** ≡ *Anthemis gaudium-solis* Velen., Fl. Bulg., Suppl. 1: 152. 1898 ≡ *Cota gaudium-solis* (Velen.) Holub in Folia Geobot. Phytotax. 9: 270. 1974.

Cota tinctoria subsp. ***parnassica*** (Boiss. & Heldr.) Oberprieler & Greuter, **comb. nova** ≡ *Cota parnassica* Boiss. & Heldr. in Boissier, Diagn. Pl. Orient., ser. 2, 3: 20. 1856 ≡ *Anthemis parnassica* (Boiss. & Heldr.) Nyman, Syll. Fl. Eur., Suppl.: 1. 1865 ≡ *Anthemis tinctoria* subsp. *parnassica* (Boiss. & Heldr.) Nyman, Consp. Fl. Eur.: 359. 1879.

Cota tinctoria subsp. ***sancti-johannis*** (Stoj. & al.) Oberprieler & Greuter, **comb. nova** ≡ *Anthemis sancti-johannis* Stoj. & al. in Gard. Chron., ser. 3, 80: 270. 1926 ≡ *Cota sancti-johannis* (Stoj. & al.) Holub in Folia Geobot. Phytotax. 9: 270. 1974.

Cota tinctoria subsp. ***virescens*** (Bornm.) Oberprieler & Greuter, **comb. nova** ≡ *Anthemis tinctoria* var. *virescens* Bornm. in Notizbl. Bot. Gart. Berlin-Dahlem 7: 19. 1917.

Leucanthemum

Leucanthemum coronopifolium subsp. ***ceratophylloides*** (All.) Vogt & Greuter, **comb. nova** ≡ *Chrysanthemum ceratophylloides* All., Fl. Pedem. 1: 190. 1785 ≡ *Leucanthemum ceratophylloides* (All.) Nym., Syll. Fl. Eur.: 10. 1855 ≡ *Chrysanthemum coronopifolium* subsp. *ceratophylloides* (All.) P. Fourn., Quatre Fl. France: 974. 1939

Leucanthemum coronopifolium subsp. ***tenuifolium*** (Guss.) Vogt & Greuter, **comb. nova** ≡ *Pyrethrum ceratophylloides* var. *tenuifolium* Guss., Pl. Rar.: 350. 1826 ≡ *Leucanthemum ceratophylloides* subsp. *tenuifolium* (Guss.) Bazzich. & Marchi in Ann. Bot. (Roma) 29: 97 (title) + 110 (footnote). 1972 ≡ *Leucanthemum tenuifolium* (Guss.) Gamisans in Candollea 27: 203. 1973.

Leucanthemum illyricum (Horvatić) Vogt & Greuter, **comb. nova** ≡ *Chrysanthemum croaticum* var. *illyricum* Horvatić in Acta Bot. Inst. Bot. Univ. Zagreb 3: 89. 1928 ≡ *Leucanthemum atratum* subsp. *illyricum* (Horvatić) Soó in Acta Bot. Acad. Sci. Hung. 23: 386. 1978, comb. inval. – The new combination was previously used by Papeš (in Acta Bot. Croat. 32: 244. 1973), but has not apparently been validated so far.

Leucanthemum ircutianum subsp. ***asperulum*** (N. Terracc.) Vogt & Greuter, **comb. nova** ≡ *Leucanthemum vulgare* var. *asperulum* N. Terracc. in Annuario Reale Ist. Bot. Roma 4: 159. 1891.

Leucanthemum ircutianum subsp. ***leucolepis*** (Briq. & Cavill.) Vogt & Greuter, **comb. nova** ≡ *Leucanthemum vulgare* subsp. *leucolepis* Briq. & Cavill. in Burnat, Fl. Alpes Marit. 6: 93. 1916.

Leucanthemum rohlenae (Horvatić) Vogt & Greuter, **comb. nova** ≡ *Leucanthemum vulgare* subsp. *rohlenae* Horvatić in Acta Bot. Inst. Bot. Univ. Zagreb 10: 93. 1935. – The new combination was previously used by Horvatić (in Acta Bot. Croat. 22: 212. 1963), but has not apparently been validated so far.

Leucanthemum visianii (Gjurašin) Vogt & Greuter, **comb. nova** ≡ *Chrysanthemum visianii* Gjurašin in Glasnik Hrvatsk. Prirodoslovn. Društva 32: 84. 1920 ≡ *Chrysanthemum leucanthemum* var. *laciniatum* Vis., Fl. Dalm. 2: 866. 1847.

Leucanthemum vulgare subsp. ***parviceps*** (Briq. & Cavill.) Vogt & Greuter, **comb. nova** ≡ *Leucanthemum vulgare* var. *parviceps* Briq. & Cavill. in Burnat, Fl. Alpes Marit. 6: 101. 1916 ≡ *Leucanthemum pallens* subsp. *parviceps* (Briq. & Cavill.) Favarger in Anales Inst. Bot. Cavanilles 32: 1235. 1975.

Mecomischus

Mecomischus pedunculatus (Coss. & Durieu) Oberprieler & Greuter, **comb. nova** ≡ *Cladanthus pedunculatus* Coss. & Durieu in Bull. Soc. Bot. France 4: 14. 1857. – The new combination was previously used by Quézel & Santa (Nouv. Fl. Algérie: 972. 1963), being ascribed to M[aire], but has not apparently been validated so far.

Phalacrocarpum

Phalacrocarpum oppositifolium subsp. ***anomalum*** (Lag.) Vogt & Greuter, **comb. nova** ≡ *Chrysanthemum anomalum* Lag. in Varied. Ci. 2(4): 40. 1805 ≡ *Phalacrocarpum anomalum* (Lag.) Cout., Fl. Portugal: 631. 1913.

Plagius

Plagius maghrebinus Vogt & Greuter, **sp. nova** – Holotype: "Plagius virgatus D.C.", [Algeria], "Le Gouraya de Bougie", 600 m, July 1896, *Reverchon,* Pl. Algérie 1896, #59 (B; isotypes: B, G, JE, M, MPU, WU). – Validating description: the Latin description of *"Leucanthemum fontanesii"* of Boissier (Diagn. Pl. Orient., ser. 2, 3: 26. 1856).

The epithet refers to the Maghreb countries (Tunisia, Algeria, Morocco), in which the species is growing. Its nomenclature has been and still is in a state of chaos, caused by successive generations of well-meaning but ill-doing botanists. The story is complex: we shall try and keep to the essentials.

Linnaeus (Sp. Pl., ed. 2: 1257. 1763) described *Cotula grandis* L. from "Barbaria" (North Africa), mentioning incidentally a similar (but in fact quite different) plant sent to him by Allioni. *C. grandis* is the basionym of *Plagius grandis* (L.) Alavi & Heywood, the correct name of a species endemic to Algeria and Tunisia. Jacquin (Obs. Bot. 4: 4, t. 81. 1771) described and figured what is clearly Allioni's taxon under the name *C. grandis*.

Allioni (Fl. Pedem. 1: 190. 1785), when describing as *Chrysanthemum discoideum* All. the plant from the SW Alps, cited *Cotula grandis* L. in synonymy, making *C. discoideum* illegitimate and automatically typified by the North African element.

Desrousseaux (in Lamarck, Encycl. 3: 737. 1792) described a plant from the Nizza County cultivated in the Jardin du Roi in Paris – obviously the same taxon as was known to Allioni and Jacquin – under the name *Matricaria virgata* Desr. In synonymy he cited *Cotula grandis* (from Jacquin) and *Chrysanthemum discoideum.* At first sight one might suspect that *M. virgata,* by inclusion of these two synonyms both based on Linnaeus's *Cotula grandis,* is in turn illegitimate. But this is not so, because Desrousseaux excluded *Cotula grandis* from his concept of *M. virgata* by basing a different name on it: *M. grandis* (L.) Desr. (l.c.: 738). The type of *M. virgata* is a specimen in the Lamarck Herbarium (P-LA, IDC microfiche #349-4!), representing Allioni's species, and the name served as basionym for *Plagius virgatus* (Desr.) DC. (Prodr. 6: 135. 1838) and later of *Leucanthemum virgatum* (Desr.) Clos (in Bull. Soc. Bot. France 17: 185. 1870), which is now its correct name.

Later in the same year Desfontaines (in Actes Soc. Hist. Nat. Paris 1: 2. 1792) published *Balsamita virgata* Desf., describing the same plant as Desrousseaux; he cited in synonymy both

Cotula grandis L. and the illegitimate, homotypic *Chrysanthemum discoideum* All. The actual, North African *C. grandis* he re-described simultaneously as a new species, *B. grandiflora;* as the latter is without synonymy, it is now a legitimate, heterotypic synonym of *Plagius grandis*. Even though Desfontaines does not mention *Matricaria virgata* Desr., *Balsamita virgata* is not the name of a new species (as such it would be illegitimate) but, under Art. 33.2 of the International Code of Botanical Nomenclature, a new combination based on the legitimate *M. virgata.*

Besides *Plagius grandis,* there is a second North African *Plagius* species that was unknown to 18th century botanists. Early 19th century collectors failed to distinguish it from the species of the SW Alps and distributed it as *P. virgatus.* Boissier (Diagn. Pl. Orient., ser. 2, 3: 26. 1856) described it as *Leucanthemum fontanesii,* but unfortunately he fell victim to the same equivocation and cited "*Balsamita virgata* Desf." in synonymy. As he failed to exclude the latter's type, either explicitly or by implication, *L. fontanesii* is an illegitimate renaming of *Matricaria virgata*. When Vogt (in Lagascalia 18: 303. 1996) transferred the epithet *fontanesii* to *Plagius* he explicitly excluded *Plagius virgatus* (Desr.) DC., i.e., the element causing the illegitimacy of *L. fontanesii,* from the species at hand. But then, he was in effect dealing with a new, so far unnamed species. His *Plagius fontanesii,* erroneously proposed as a new combination for which no type was designated, fails to meet the criteria for valid publication.

Rhodanthemum

Rhodanthemum gayanum subsp. ***antiatlanticum*** (Emb. & Maire) Vogt & Greuter, **comb. nova** ≡ *Leucanthemum gayanum* var. *antiatlanticum* Emb. & Maire in Bull. Soc. Hist. Nat. Afrique N. 23: 191. 1932 ≡ *Leucanthemum gayanum* subsp. *antiatlanticum* (Emb. & Maire) Maire in Bull. Soc. Hist. Nat. Afrique N. 31: 23. 1940. – The new combination was previously used by Ibn Tattou (in Bocconea 8: 49. 1998), where it is invalid under Art. 33.5 of the International Code of Botanical Nomenclature. It has not apparently been validated so far.

Tanacetum

Tanacetum corymbosum subsp. ***achilleae*** (L.) Greuter, **comb. nova** ≡ *Chrysanthemum achilleae* L., Syst. Nat., ed. 12, 2: 562. 1767 ≡ *Pyrethrum corymbosum* subsp. *achilleae* (L.) Nyman, Consp. Fl. Eur.: 372. 1879.

Tanacetum polycephalum subsp. ***filipendulinum*** (Boiss.) Greuter, **comb. nova** ≡ *Pyrethrum filipendulinum* Boiss., Diagn. Pl. Orient. 11: 24. 1849.

Address of the authors:
Prof. Dr Werner Greuter, Dr Christoph Oberprieler & Dr Robert Vogt, Botanischer Garten und Botanisches Museum Berlin-Dahlem, Freie Universität Berlin, Königin-Luise-Str. 6-8, D-14191 Berlin, Germany; e-mail: w.greuter@bgbm.org; c.oberprieler@bgbm.org; r.vogt@bgbm.org